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(71) Applicant *(for all designated States except US)*: **SUPERSALE.COM** [US/US]; 18912 Lake Drive W., Chanhassen, MN 55317 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **TERP, John, Chris** [US/US]; 14960 Pioneer Trail, Eden Prairie, MN 55347 (US). **TAUNTON, Peter, Jon** [US/US]; 1181 Hesse Farm Road, Chaska, MN 55318 (US).

(74) Agent: **BRUESS, Steven, C.**; Merchant & Gould P.C., P.O. Box 2903, Minneapolis, MN 55402-0903 (US).

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(54) Title: METHOD AND APPARATUS FOR ACQUIRING AND PROVIDING INVENTORY DATA

(57) Abstract: A portable inventory device comprised of an image scanner, a digital camera, a receiver configured to receive standard inventory item profile files, a memory arrangement coupled to the image scanner and the digital camera and configured to store data representing the standard inventory item profile files, and a processor coupled to the image scanner and the digital camera and the memory arrangement. The portable device performs the function of quickly and accurately gathering highly detailed inventory profile information on items being inventoried. The portable device gathers highly detailed inventory profile information by way of automatically retrieving a standard inventory item profile file from memory and providing the user of the portable device with an opportunity to update the inventory item profile file. The system further updates an inventory item profile file by including a digital image of the item being inventoried and storing the inventory item profile file along with the digital image in a web server ready format.

METHOD AND APPARATUS FOR ACQUIRING AND PROVIDING INVENTORY DATA

Technical Field

The present invention is directed to integrated systems capable of acquiring various types of inventory information and providing the inventory information to various channels of inventory distribution.

Background of the Invention

Inventory data is a necessary element to sales operations. The ability of each entity in the product distribution chain to provide detailed information about each item to the next entity in the chain is critical. The rate at which the inventory information can be acquired and then provided to the distribution channels directly affects the rate at which products within the inventory can be sold.

Acquiring inventory data is largely a manual task. Specific information about each item within the inventory must be noted and entered into a system that can store the data and provide it to the distribution channels when necessary. Acquiring the inventory often requires photographs of each item to be made. A person must use some type of camera to take the photograph, and then the photograph must be stored for later use. This storage might involve filing a tangible photograph in a file associated with the item. In the case of a digital camera, the image file must be stored in an associated bin in a storage device. When the items to be inventoried are each unique, the information demonstrating the items' unique characters must be acquired. This step will often require a person to observe an item and note its characteristics. In many cases, an item will have some identifier, such as an identification number. This number must be entered into the inventory system in some manner. All of the information about each item must be kept together and assimilated in a form suitable for use in the distribution channel. The items within the inventory may have sporadic locations, rather than being grouped within a warehouse. In such a case, the acquisition process must be performed in a mobile environment.

Each step in acquiring and providing the inventory data introduces several problems. A different device is necessary for completion of each step. Thus, the whole process is cumbersome, especially so in cases where the inventory is spread about. Also, since acquiring the data is a manual task, human error will be inevitable and the process will be slow as well. These truths are apparent in the context of entering an identification number or characteristic that must be observed. Often an identification number has 10, 20, or even more characters and numerals. A

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person will not be able to observe the number and then correctly record it for every item. As a result, bad data will be entered into the system and this will at least require the identification number to be re-entered. Also, the amount of time required to observe the number and correctly enter it hinders the efficiency of the sales operations. Even if the data is correctly recorded, a possibility of incorrect data correspondence still exists. The identification number may be assigned to the wrong set of characteristics that were observed and recorded, for instance.

It is essential that the inventory information be gathered and distributed quickly and accurately. Internet commerce magnifies this need because it is possible for sales to occur on the Internet contemporaneously with the acquisition of the item being sold. Therefore, Internet commerce has created the need for a system that can accurately acquire highly detailed inventory data, assimilate it, and provide it to the appropriate Internet location in a contemporaneous, portable fashion.

Summary

The present invention is a portable inventory device for assisting with the creation of inventory profiles for products. The portable inventory system generates a complete inventory item profile comprised of a digital image of the inventory item, a general description of the inventory item, and inspection notes obtained from observations of the inventory item by a person. The portable inventory device includes at least an image scanner, a digital camera, and a receiver that is configured to receive a plurality of data files that represent standard inventory profiles for a plurality of inventory items. An article inventory file is a file including an industry-wide accepted format used in describing an inventory item in a specific channel of trade. The portable device also includes at least a memory arrangement that is coupled to the image scanner and the digital camera and configured to store data representing the standard inventory profiles for a plurality of inventory items. The portable apparatus further includes a processor coupled to the image scanner, the digital camera and the memory arrangement. The processor is configured to process an image of an inventory item's identifier that is captured by the image scanner. In the present embodiment, the identifier is an identifying bar code. In other embodiments, the identifier may be actual alpha numeric characters. The processor processes the image captured by the image scanner in order to determine an alpha numeric representation of the bar code. The alpha numeric representation of the bar code is cross referenced with a look-up table stored in the memory arrangement and linked to the standard inventory profiles of inventory items by an inventory item's bar code. The processor retrieves the standard inventory profile

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from the memory arrangement and displays it upon a display screen of the portable device. The processor then may prompt the user of the portable device to review and modify the standard inventory profile of the inventory item being observed, if necessary.

Next, the user may input customized inventory item information including information concerning the user's inspection of the article's condition. The standard inventory profile, including any modifications to the standard inventory profile, along with any observation information is stored in a revised item inventory profile. Next, the user may capture a digital image of the item being inventoried with the portable device's digital camera. The digital image captured is attached to the revised item inventory profile and both the item inventory profile and the captured image are processed and stored in a web user format as a customized item inventory information file. This customized item inventory information file may be transmitted to the server of a web site following docking the apparatus in a docking station or via a wireless transmission of the information file to a host system.

Brief Description of the Drawings

The invention may be more completely understood in consideration of the following detailed description of the invention in connection with the accompanying drawing, which are incorporated in and constitutes a part of this specification, in which:

Fig. 1 shows a device for acquiring and providing inventory data, according to one embodiment;

Fig. 2 illustrates the system used to acquire and provide the inventory data, according to one embodiment;

Fig. 3 further illustrates the system used to acquired and provide the inventory data, according to one embodiment;

Fig. 4 shows the connection options of one embodiment of the system to distribution channels;

Fig. 5 illustrates one embodiment of the operational flow used to control the system when acquiring inventory data;

Fig. 6 illustrates one embodiment of the operational flow used to control the system when providing the inventory data to distribution channels; and

Fig. 7 further illustrates the operational flow used to provide the inventory data to entities in the distribution channels.

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Detailed Description

In the following detailed description of the preferred embodiment, reference is made to the accompanying drawings which form a part hereof and in which is shown by way of illustration a specific embodiment in which the invention may be practiced. This embodiment is described in sufficient detail to enable those skilled in the art to practice the invention and it is to be understood that the other embodiments may be utilized and that structural or logical changes may be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims.

The present invention comprises a portable device for quickly and accurately gathering highly detailed inventory profile information on items being inventoried. The portable device includes an image scanner, a digital camera, a receiver configured to receive standard inventory item profile files, a memory arrangement coupled to the image scanner and the digital camera and configured to store data representing the standard inventory item profile files, and a processor coupled to the image scanner and the digital camera and the memory arrangement. The processor is configured to process an image of an inventory item's identifier that is captured by the image scanner to determine a representation for the identifier that may be processed by a computer. In the present embodiment, the identifier is a bar code. The imaged bar code is processed to determine an alpha numeric representation of the bar code. It is to be understood that the identifier may be bar codes, actual numbers and letter and any other form of an identifier that can be imaged and processed by a computer.

The processor is further configured to retrieve data representing the inventory item profile file from data storage by virtue of a link between the alpha numeric representation of the bar code and the inventory item profile file. The portable device generates customized inventory item information files that are comprised of a revised inventory item profile file and a digital image of the inventory item being profiled that is captured by the digital camera. The portable device performs the function of creating customized inventory item profile files by performing the following processing steps. First, an image is captured of the bar code of the item being inventoried by the image scanner. Next, the bar code image captured is processed to generate an alpha numeric representation of the bar code. Next, an inventory item profile file associated with the alpha numeric representation of the bar code is retrieved from the portable device's memory. Next, the inventory item profile file is displayed on a screen within the portable device so that the user of the portable device may review the inventory item profile file for accuracy. Next,

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the user is provided with an opportunity to update the inventory item profile file. An update to the inventory item profile file includes modifying the inventory item profile file and capturing a digital image of the inventory item and attaching it to the revised inventory item profile file. The digital image of the item being inventoried is captured by a digital camera which comprises part of the portable device. Next, the digital image captured and the revised inventory item profile file are stored in memory. Next, the revised inventory item profile file is processed and stored in a format wherein the inventory item profile file and digital image are Internet ready. An Internet ready revised inventory item profile file is a file that is accessible by users of the worldwide web following storage of the revised inventory item profile file as a thumbnail sketch on a web site server. The Internet ready revised inventory item profile file may be transmitted to the server of a web site automatically after the portable device is docked in a docking station. In the alternative, the Internet ready revised inventory item profile file may be transmitted by initiating a download command sequence wherein the revised inventory item profile file is transmitted wirelessly to a host database system which is configured to transmit and store the revised inventory item profile file on a web server.

Referring to Fig. 1, an embodiment of a portable device for quickly and accurately gathering highly detailed inventory information is shown. The portable device 100 includes a pen tablet 102 and a folding cover 106. The pen tablet 102 is a small computer system such as the Fujitsu stylistic LT. As Fig. 1 discloses, the pen tablet includes a touch screen display 104. The touch screen display 104 provides a user interface to display inventory item profile files to the user. The touch screen display 104 of the pen tablet 102 may also display an image of the inventory item being captured as well as any necessary screen displays that assist the operator in acquiring inventory information needed to complete a revised inventory item profile file. The pen tablet 102 functions as a stand-alone computer, as discussed with reference to Fig. 2 in greater detail below.

The folding cover 106 of the portable device 100, includes a digital camera 108, a bar code scan engine 110, and an associated scan trigger 112. The folding cover 106 is hinged to the pen tablet 102 and folds over the pen tablet 102 to protect it when not in use. When the folding cover 106 is manipulated such that it is positioned almost perpendicular to the pen tablet 102, such positioning of the folding cover 106 enables the device's portability. When the portable device 100 is in use, the folding cover 106 uncovers the pen tablet 102's touch screen 104 and allows the operator to access both the touch screen 104 and all of the functional devices within the holding cover 106.

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The digital camera 108 housed within the folding cover 106 is commercially available and is typically a 3COM HomeConnect. The camera 108 allows the operator to capture digital images of the inventory items when acquiring the necessary inventory information. If the portable apparatus was being used in the automotive industry for example, the digital camera 108 is used to capture images of the automobile that will subsequently be shown to potential buyers. Also, the digital camera 108 may be used to capture an image of the Vehicle Identification Number (VIN) which is located on a plate on the dashboard of the vehicle. The digital cameral 108 may be used to capture several images of the same vehicle so that a virtual tour may later be constructed. It is to be understood that the portable device is intended to be used to inventory any types of items that have unique identification numbers. Automobiles, for example have unique vehicle identification numbers. Other items that could be inventoried using the portable device include motorcycles, snowmobiles, and boats.

The bar code scan engine 110 included in one embodiment of the folding cover is commercially available and is typically a Welch-Allyn 3800 Imagesetter. Such a scan engine permits a bar code that carries an identification number for an item to be imaged, rather than merely read, and then the identification number is extracted from the image through known techniques. Such a scanner is useful where clean visibility of the bar code is not readily accessible, such as in the case where the VIN has to be scanned through automobile glass, as is often the case with the VIN bar code on General Motors' automobiles. The VIN bar code on these cars is located beneath transelective laminated safety glass. Ordinary bar code readers will not pick up the bar code through the glass, so a bar code scan engine is preferred for such applications. The scan trigger 112 permits the operator to activate the scan engine.

Fig. 2 shows part of the system implemented by the pen tablet 102 and the folding cover's 106 components. The pen tablet 102 provides a computer processor 202 that has associated memory 214 and data storage 204. The processor 202 is typically an Intel Pentium. The memory 214 is some form of RAM. The data storage 204 is typically a hard disk drive. The touch screen 104 interfaces with graphics hardware that is in communication with the computer processor 202. The computer processor 202 also communicates with a USB port 212 such as a Targus PA060, a docking station interface 208, and a wireless communications interface 206. The processor 202 is controlled by an operating system, typically Windows 98.

Additionally, in one embodiment of the invention, a program is executing during operation of the device 100 which prompts and assists the operator in acquiring and providing the data, as will be discussed with reference to Figs. 5

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and 6. Under this program in the case of automobiles, the processor explodes the VIN for an automobile. Exploding the VIN refers to the process of referencing the VIN with a set of National Automotive Dealer Association (NADA) look up tables stored in the hard disk 204 to find all of the NADA information about the current vehicle, including year, make, model, body style, and available accessories. The memory 214 is implemented in this process to temporarily store the captured VIN image and the alpha numeric representation of the VIN determined. Other information as directed by the operating system and the program under execution is also stored in memory.

With reference to Fig. 3, the folding cover 106 contains the USB hub 210 that is in electrical communication with the USB port 212 of the pen tablet 102. The USB hub 210 permits the pen tablet 102 to receive information from the digital camera 108 and the bar code scan engine 110, which are also in electrical communication with the USB hub 210.

Fig. 4 shows the docking station 402 and the wireless communications device 404. The docking station 402 provides a fixed portal for the device 100 to access distribution channels such as the Internet 408. The wireless communications device 404 permits the device 100 to access the distribution channels while maintaining portability. The docking station 402 comes into electrical communication with the device 100 when the pen tablet 102 is docked in the station 402 through the docking station interface 208. The docking station 402 may also contain have a printer 403 electrically connected thereto via a dedicated printer port (not shown) on the docking station. The printer may be used to print information about the inventory items, such as window stickers for vehicles. The wireless communications device 404 may be included in the folding cover 106 and can maintain permanent electrical communication with the device 100 either through the wireless communications interface 206 or the USB hub 210. Using either the docking station 402 or the communications device 404, the executing program for the portable device 100 dials-up an Internet Service Provider (ISP) 406 that maintains a server with a sequel database and a connection to the Internet 408. After the docking station 402 and the ISP 406 have been connected, the docking station 402 initiates a File Transfer Protocol (FTP), wherein an entire copy of all new and updated files and their images are transmitted to a host web server 409. These files, having previously been compressed, are uncompressed and stored in a database within the host web server 409. The database is then used by the host web server 409 to perform active server pages, which are accessing the records stored in the database within the host web server 409. The active server pages recognize that new inventory has been stored in the database within the host web server 409 and causes

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the new inventory records, which may consist of new and revised records, to be displayed on the dealer web pages that are on the host web server 409. Each inventory dealer may have a page on the host web server 409 web site, at which are thumbnail sketches of the inventory items. Selecting a thumbnail sketch at the dealer web site page presents a full image of the inventory item and full detail information on the inventory item. All of the information retrieved by selecting the thumbnail sketch is being pulled from the database which was populated with data uploaded from the portable device. In addition copies of new and updated files and their images may be FTP transmitted to other web sites 410 and 412. The host web server 409, controlled by an executing program, orchestrates the FTP transfer of the inventory data acquired by the device 100 to additional web sever destinations which, in the present embodiment, are dealer websites 410 and 412 in the case of Internet commerce.

Fig. 5 demonstrates an embodiment of the operational flow of the data acquisition process for automobiles. At step 502, the inventory process starts after the operator selects inventory from a main menu. Step 504 provides a decision, whereby the operator decides whether the vehicle to be inventoried is already on record in the system. If so, the operator chooses course of action A. If not, the operator chooses course of action B.

Under course of action A, step 506 displays the sales list of all of the vehicles already on record. Step 508 permits the operator to sort through the lists of vehicles to find the proper portion of the list that contains the current vehicle. Step 510 prompts the user to either select the current vehicle from the list or scan the VIN. If the operator chooses to select the vehicle from the list, step 514 accepts the selection from the operator. If the operator chooses to scan the VIN, step 512 accepts the VIN that is provided by the bar code scan engine 110. After the vehicle is selected at step 514 or the VIN is scanned at step 512, step 516 retrieves the vehicle's record that is stored on the storage device 204. Once the record is found, the system progresses to step 530, where the VIN is checked against the NADA tables to see if it is valid.

If, back at step 504, the operator had not known whether the vehicle was already on record or knew that it was not, course of action B would be chosen. Step 518 prompts the user to scan the VIN. Step 520 accepts the VIN that is generated by the bar code scan engine 110. Step 522 determines whether the VIN is on record by scanning through the records stored on the storage device 204. If the VIN is on record, then step 524 retrieves the record from the storage device 204. If the VIN is not on record, then step 526 creates a vehicle record by creating a bin on the storage device 204 and records the VIN in the bin. After the record has been

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retrieved or created, step 530 checks the VIN against the NADA tables to see if it is valid.

Once step 530 is complete, either the VIN is exploded by step 532 for a valid VIN or the user is prompted to enter the NADA data by step 534 for an invalid VIN. The NADA data is general vehicle data including the year, make, model, and body style. The user enters this data through the touch screen 104 of the pen tablet 102. After the general data has been exploded or entered, step 536 prompts the user to enter the specific vehicle data. The specific vehicle data includes mileage, stock number, color, engine, and transmission information. After the specific vehicle data has been entered, step 538 displays the value options and prompts the user to select an options package for the current vehicle. The options packages include accessories such as air conditioning and stereo. The operator may select or de-select individual accessories within the options packages. After step 538 is complete, step 540 displays pricing guidelines based upon the information from the NADA tables, the specific vehicle information entered, and the options selected by the operator. The pricing guidelines include the NADA trade, loan, and market values of the vehicle. Step 540 also prompts the operator to enter the asking price for the vehicle.

Once the asking price has been entered, step 542 either directs course of action AA or BB to occur, depending upon what course of action, A or B, was earlier chosen. If A was chosen earlier, then AA is the proper course of action and the operation jumps to step 544. Step 544 displays the image(s) on record for the current vehicle and then prompts the user to either select the current image(s) or clear them. If the operator selects them, then operation jumps to step 548 to permit confirmation of the data. If the operator chooses to clear the image(s) on record, then step 546 prompts the user to take a photograph with the digital camera 108 and then receives input from the camera 108. Once the image data has been received, step 548 then permits confirmation of the data.

If course of action B was chosen earlier, then BB is the proper course of action and operation flow jumps from step 542 to step 558. Step 558 prompts the user to take a photograph of the vehicle and receives input from the digital camera 108. Once the image data has been received, step 548 then permits confirmation of the data.

At step 548, the operator is permitted to modify any of the vehicle data. Once all modifications are made, step 548 generates and stores a profile for the current vehicle that contains vehicle specifications, pricing, and image(s). Step 550 permits a window sticker containing the vehicle's information to be printed by the printer 302. Step 552 prompts the user to decide whether to enter another vehicle. If

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another is to be entered, the operation flow jumps back to step 504 to determine the proper course of action A or B for the new vehicle. If no more cars are to be entered, step 556 ends the inventory process and sends operation back to the main menu.

Once the inventory process is complete, the operator may choose connect from the main menu. Fig. 6 shows the operational flow for the connect process. At step 602, the upload process begins from the main menu. Step 604 dials the Internet Service Provider (ISP) through the docking station 402 or the wireless communications device 404. The ISP 406 provides access to the server as well as access to dealers' web sites 410 and 412 through the Internet 408. Once the connection to the server is made, step 606 compresses the profiles for the vehicles on record. Step 608 sends the compressed profiles to the sequel database stored on the server through the ISP 406. Step 610 then determines whether the sequel database contains an updated NADA tables relative to the NADA tables stored in the device 100. If an updated database exists, step 612 downloads the compressed database tables. Step 614 decompresses the new tables on the storage device 204. Then Step 616 disconnects the device 100 from the ISP 406. If step 610 determines that updated tables do not exist, then operation jumps directly to step 616 which disconnects. Step 616 sends operation back to the main menu after disconnecting.

Fig. 7 illustrates the operational flow that occurs in providing the profiles to the appropriate dealers' websites 410 and 412. Step 702 starts the transfer process after all compressed profiles have been received by the server. Step 704 decompresses the profiles. Step 706 extracts the profiles to the dealers' Internet directories (websites) in the appropriate form for display. Step 708 generates thumbnail images for each image that was stored in the profiles by resizing the images. Step 710 provides the thumbnails to the appropriate dealers' directories. The thumbnails are useful because they allow webshoppers to quickly glance over a large number of cars and only click on the cars of interest. Once the thumbnail is clicked, the full-size image may be displayed.

While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various other changes in the form and details may be made therein without departing from the spirit and scope of the invention.

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Claims

WHAT IS CLAIMED

1. A method of collecting inventory information on a portable apparatus for a plurality of inventory items, wherein each inventory item has an identifier, the method comprising:

(a) capturing an image of an inventory item's identifier and processing said image to determine a alpha numeric representation of said identifier;

(b) retrieving an inventory item profile file associated with said alpha numeric representation of said identifier from data storage;

(c) displaying said inventory item profile file received;

(d) generating and storing new inventory item information in a revised inventory item profile file, wherein said revised inventory item profile file includes data from said inventory item profile file and said new inventory item information generated.

2. The method of claim 1 further including the step of transmitting said new inventory item information generated and stored to a host central database.

3. The method of claim 1 wherein said identifier is a barcode.

4. The method of claim 1 wherein said new inventory item information generated includes data captured by the portable apparatus representative of a digital image of said inventory item.

5. The method of claim 1 wherein said new inventory item information generated includes observation information input by the user of the portable apparatus at the time said inventory item was being observed.

6. The computer implemented method of claim 1 wherein said revised inventory item profile file generated by the processor of the portable apparatus is formatted for storage on an Internet server and on-line access via the Internet.

7. The computer implemented method of claim 1 including the additional step of transmitting said revised inventory item profile file to a web server.

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8. The computer implemented method of claim 7 wherein the step of transmitting said revised inventory item profile file is accomplished by docking said portable apparatus into a docking station and downloading said revised inventory item profile file to said web server.

9. The computer implemented method of claim 7 wherein the step of transmitting said revised inventory item profile file is accomplished by wireless transmission of said revised inventory item profile file to a host system.

10. A computer implemented inventory system for assisting with the inventory profiling of products by generating a complete inventory file comprised of a digital image of an inventory item, general description data for the inventory item, and observation data for the inventory item, the system comprising:

(a) an image scanner;

(b) a digital camera;

(c) a receiver configured to receive data representing an inventory item file;

(d) a memory arrangement coupled to said image scanner and said digital camera and configured to store said data representing an inventory item file;

(e) a processor coupled to said image scanner, said digital camera and said memory arrangement and configured to:

process an image of an identifier of said article captured by said image scanner to determine an alpha numeric representation of said identifier;

retrieve said data representing said inventory item file, wherein said data representing said inventory item file is associated with said alpha numeric representation of said identifier;

generate customized article inventory information files comprised of a revised inventory item file and a digital image of said article captured by said digital camera.

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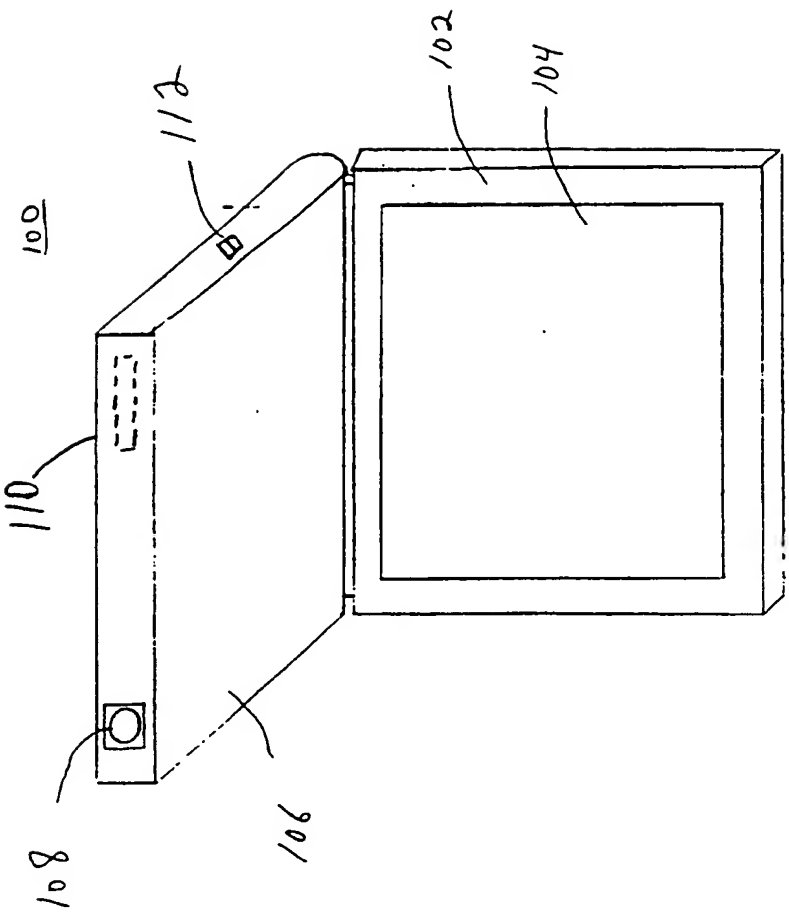

Fig. 1

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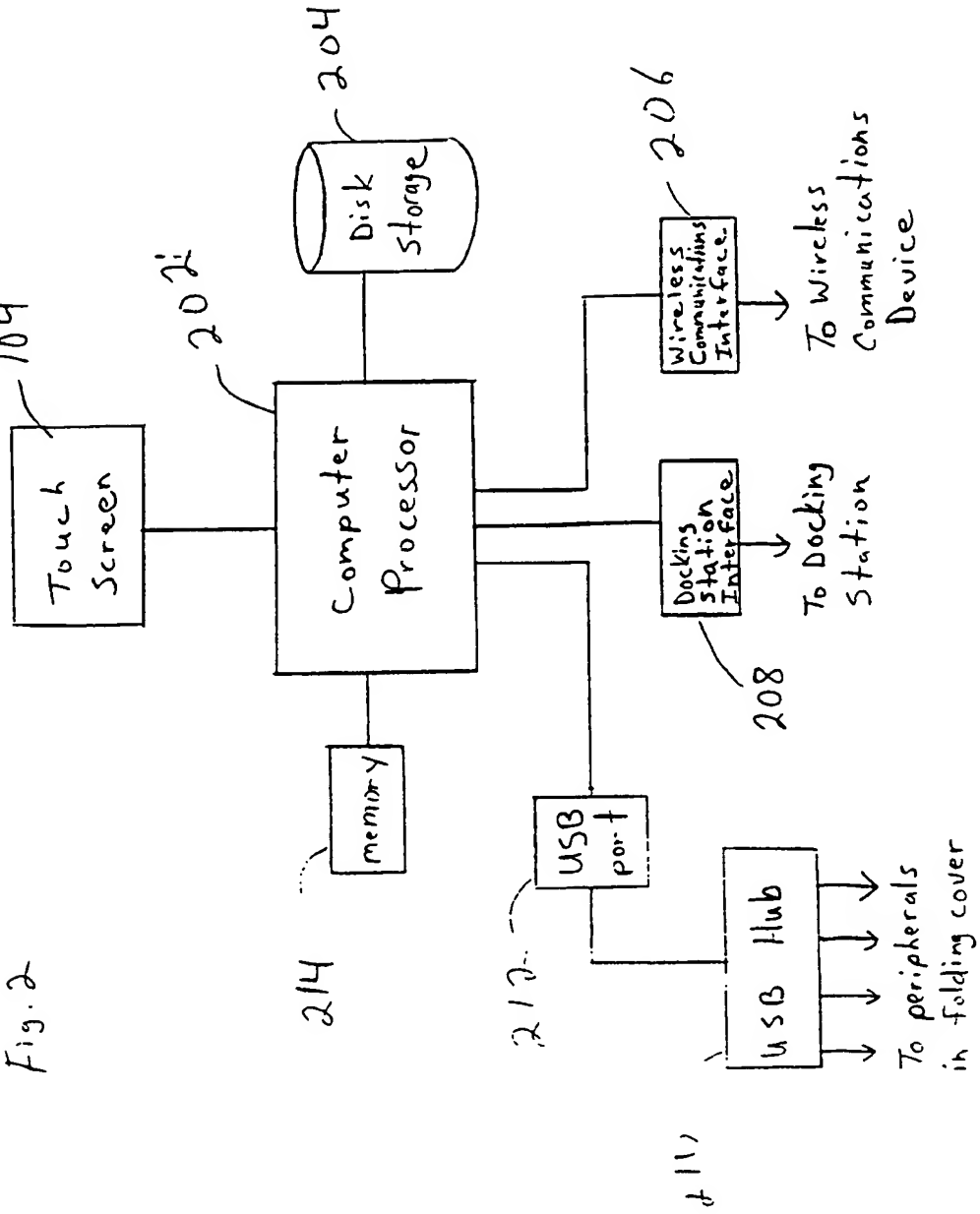

Fig. 2

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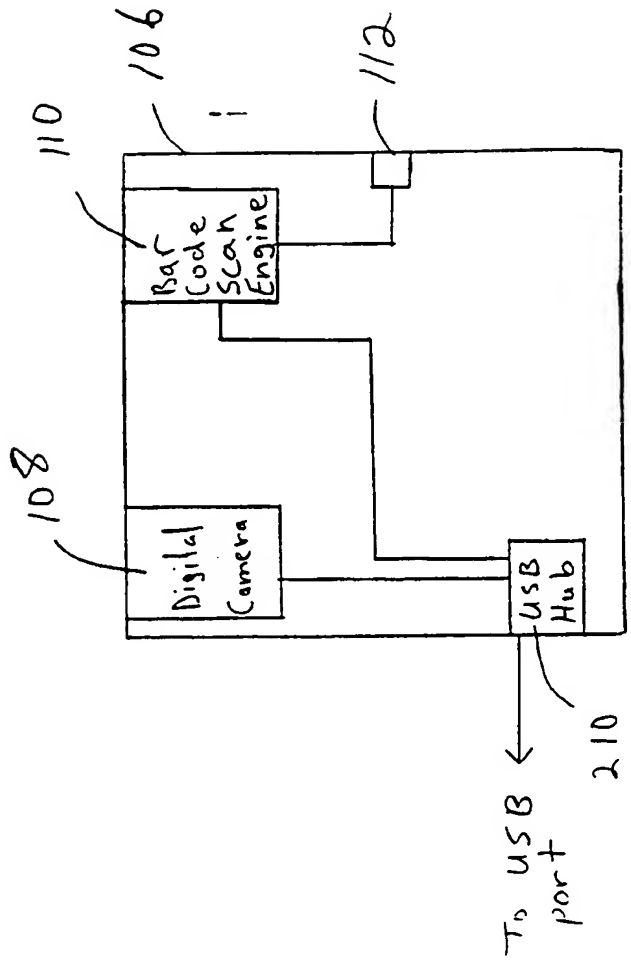

Fig. 3

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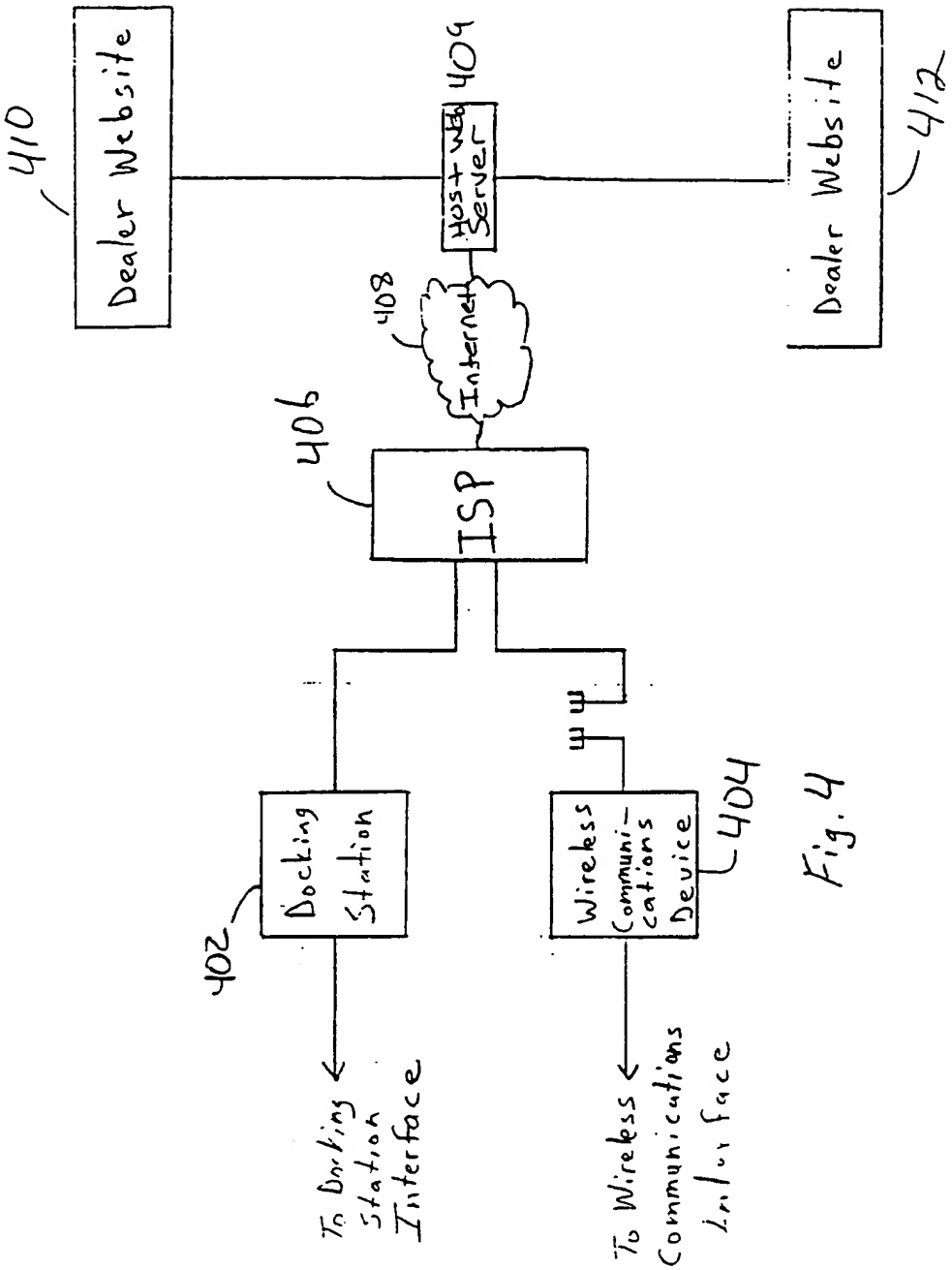

Fig. 4

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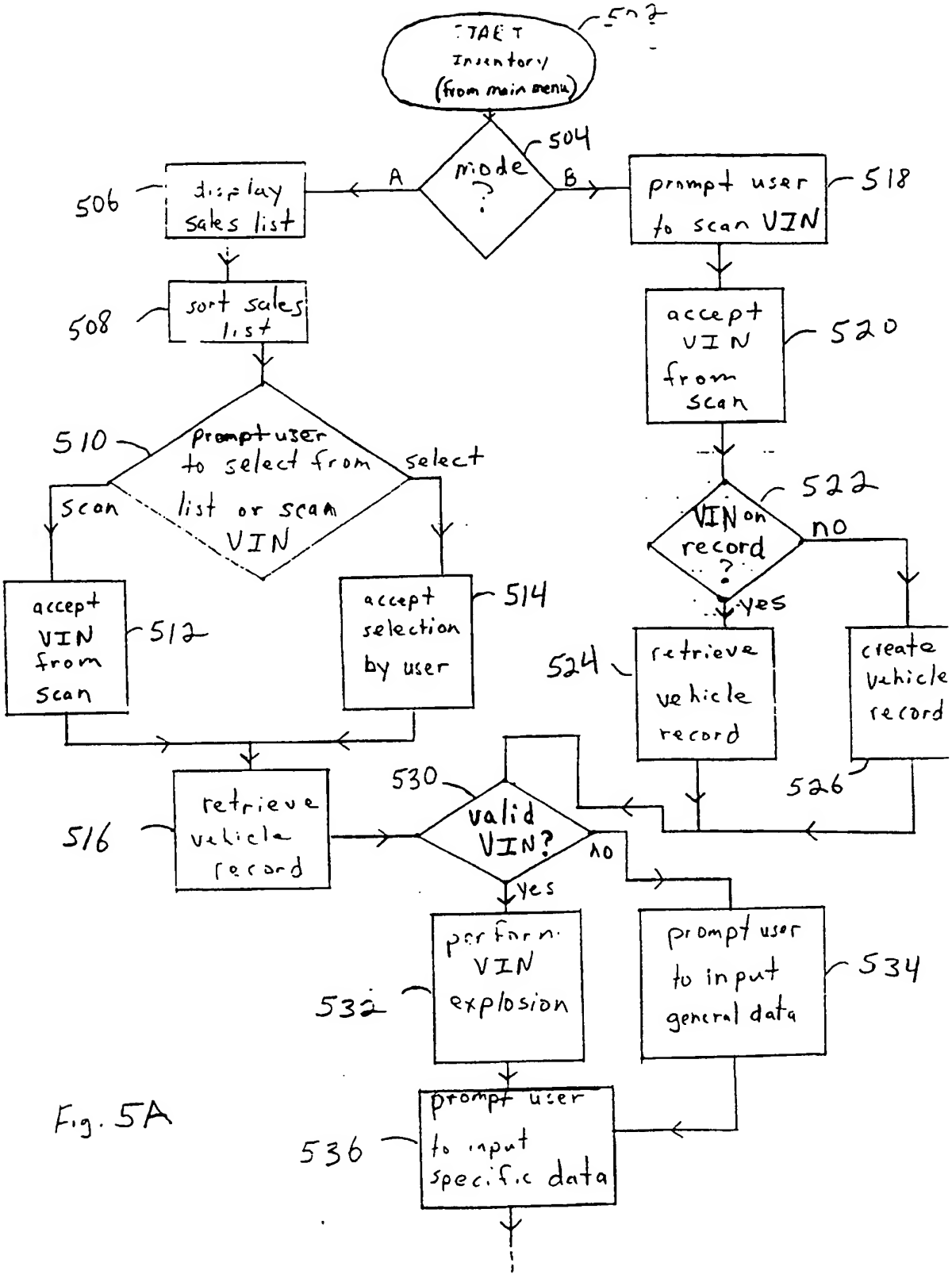

Fig. 5A

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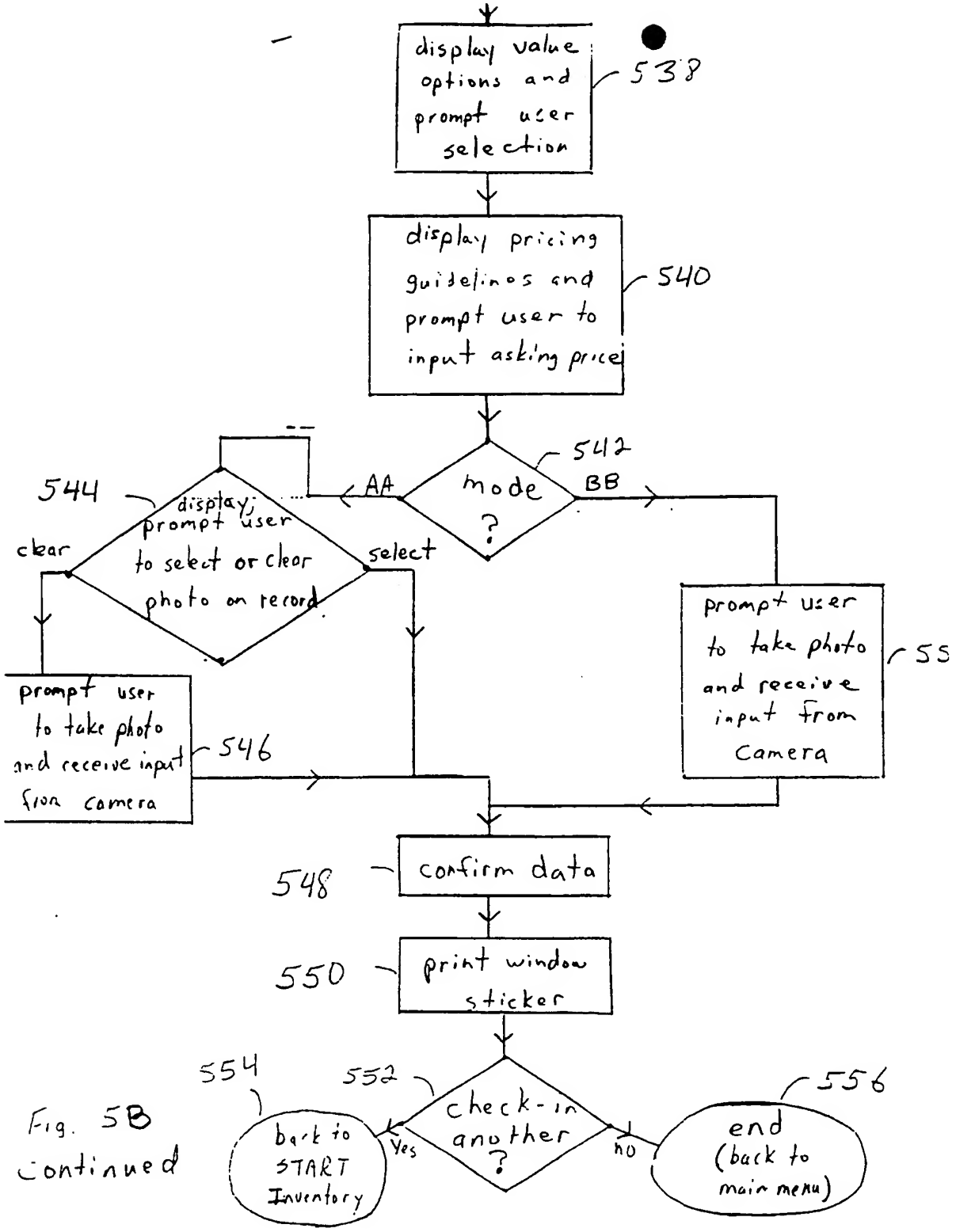

Fig. 5B continued

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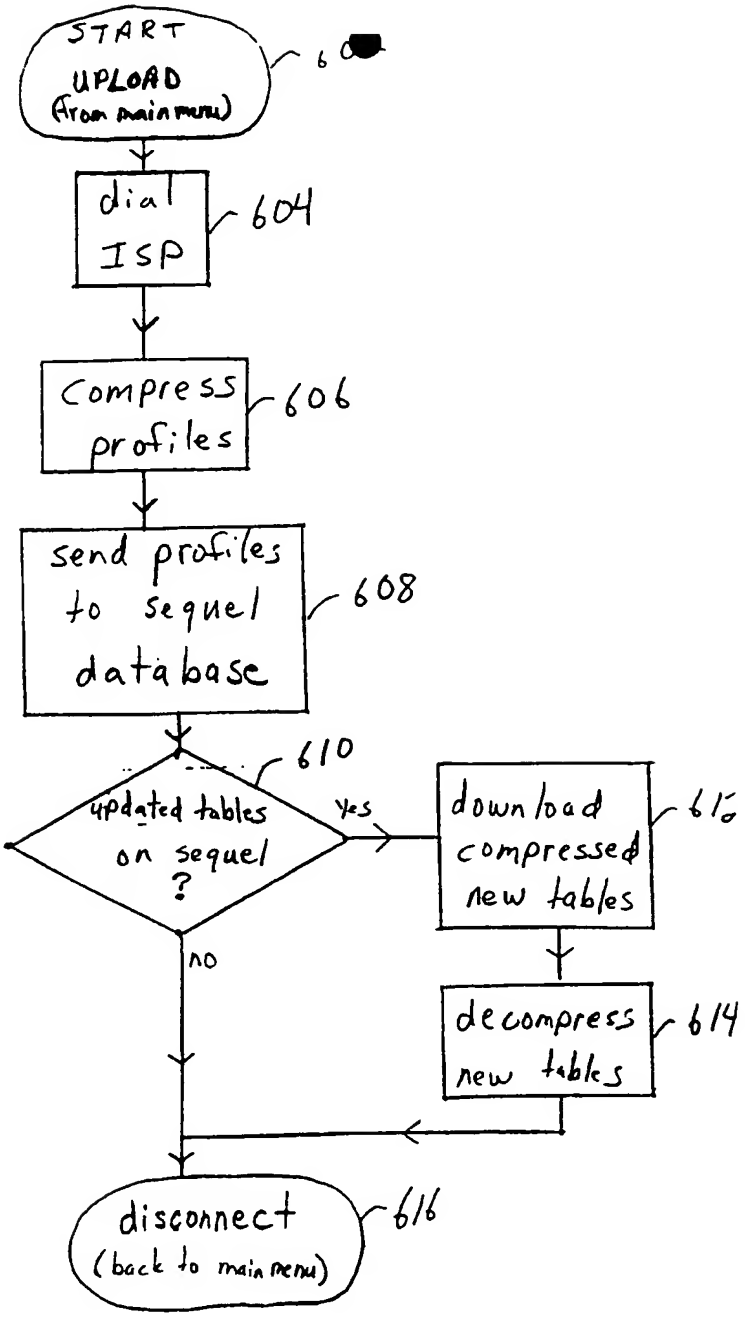

Fig. 6

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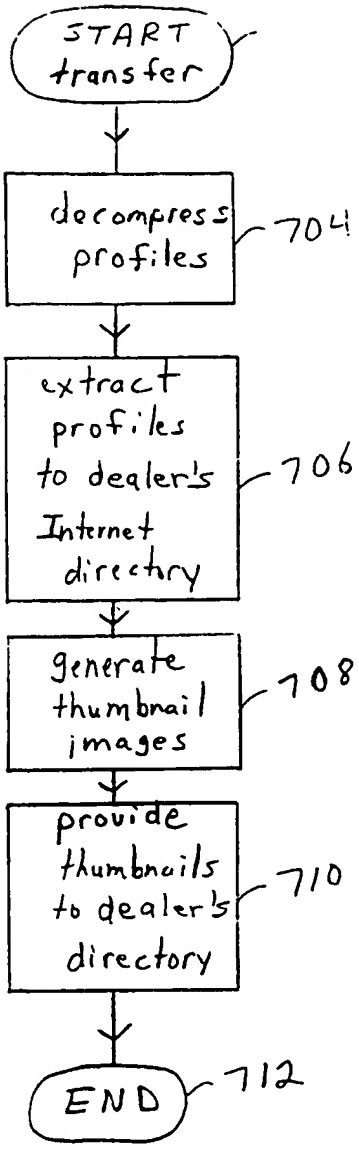

Fig. 7

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(71) Applicant *(for all designated States except US)*: **SUPERSALE.COM** [US/US]; 18912 Lake Drive W., Chanhassen, MN 55317 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **TERP, John, Chris** [US/US]; 14960 Pioneer Trail, Eden Prairie, MN 55347 (US). **TAUNTON, Peter, Jon** [US/US]; 1181 Hesse Farm Road, Chaska, MN 55318 (US).

(74) Agent: **BRUESS, Steven, C.**; Merchant & Gould P.C., P.O. Box 2903, Minneapolis, MN 55402-0903 (US).

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(54) Title: METHOD AND APPARATUS FOR ACQUIRING AND PROVIDING INVENTORY DATA

(57) Abstract: A portable inventory device comprised of an image scanner, a digital camera, a receiver configured to receive standard inventory item profile files, a memory arrangement coupled to the image scanner and the digital camera and configured to store data representing the standard inventory item profile files, and a processor coupled to the image scanner and the digital camera and the memory arrangement. The portable device performs the function of quickly and accurately gathering highly detailed inventory profile information on items being inventoried. The portable device gathers highly detailed inventory profile information by way of automatically retrieving a standard inventory item profile file from memory and providing the user of the portable device with an opportunity to update the inventory item profile file. The system further updates an inventory item profile file by including a digital image of the item being inventoried and storing the inventory item profile file along with the digital image in a web server ready format.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/41685

A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

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X	WO 99 42029 A (WELCH ALLYN INC) 26 August 1999 (1999-08-26) page 4, line 14 -page 6, line 11; figures 16,16A,16B,,18 page 21, line 6 -page 22, line 7 --- -/--	1-10

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Date of the actual completion of the international search	Date of mailing of the international search report
8 March 2002	19/03/2002

Name and mailing address of the ISA	Authorized officer
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